

## PATENT COOPERATION TREATY

PCT

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)


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Applicant's or agent's file reference 03 1374 5730	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416).
International Application No. PCT/AU2003/001053	International Filing Date (day/month/year) 19 August 2003	Priority Date (day/month/year) 19 August 2002
International Patent Classification (IPC) or national classification and IPC Int. Cl. <sup>7</sup> C07D 207/36, 207/44, 307/58; C08F 224/00; A61K 31/4015, 31/341, 7/16; A61P 31/00, 33/00, 17/10; A01N 43/08, 43/36; A61L 12/14; B08B 17/02		
Applicant BIOSIGNAL LIMITED et al		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 6 sheets, including this cover sheet.
- ☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).
- These annexes consist of a total of sheet(s).
3. This report contains indications relating to the following items:
- I ☒ Basis of the report
  - II ☐ Priority
  - III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
  - IV ☐ Lack of unity of invention
  - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
  - VI ☐ Certain documents cited
  - VII ☐ Certain defects in the international application
  - VIII ☒ Certain observations on the international application

Date of submission of the demand 1 February 2004	Date of completion of the report 29 November 2004
Name and mailing address of the IPEA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustralia.gov.au facsimile No. (02) 6285 3929	Authorized Officer  KATHERINE MOERMAN Telephone No. (02) 6283 2714

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/AU2003/001053

**I. Basis of the report****1. With regard to the elements of the international application:\***

- ☒ the international application as originally filed.
- ☐ the description, pages , as originally filed,  
pages , filed with the demand,  
pages , received on with the letter of
- ☐ the claims, pages , as originally filed,  
pages , as amended (together with any statement) under Article 19,  
pages , filed with the demand,  
pages , received on with the letter of
- ☐ the drawings, pages , as originally filed,  
pages , filed with the demand,  
pages , received on with the letter of
- ☐ the sequence listing part of the description:  
pages , as originally filed  
pages , filed with the demand  
pages , received on with the letter of

**2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.**

These elements were available or furnished to this Authority in the following language which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

**3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:**

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished
- ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/fig.

- ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\*

*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).*

*Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report*

**III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability**

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be nonobvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application,

☒ claims Nos: 1-117(in part)

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):

☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☒ no international search report has been established for said claim Nos. 1-117 (in part)

A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

☐ the written form has not been furnished or does not comply with the standard.

☐ the computer readable form has not been furnished or does not comply with the standard.

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****1. Statement**

Novelty (N)	Claims 1-17, 19-23, 25-27, 30-33, 36-40, 58-70, 93-98, 114-117	YES
	Claims 18, 24, 28, 29, 34, 35, 41-57, 71-92, 99-113	NO
Inventive step (IS)	Claims 1-17, 19-23, 25-27, 30, 39, 40, 58-70, 93-98, 114-117	YES
	Claims 18, 24, 28, 29, 31-38, 41-57, 71-92, 99-113	NO
Industrial applicability (IA)	Claims 1-117	YES
	Claims	NO

**2. Citations and explanations (Rule 70.7)**

The present application is directed to compounds of formulae II, III, IV, V and VI; methods of producing these compounds; oligomers and polymers containing these compounds and the use of these compounds as antimicrobial/antifouling agents and in medical/scientific/biological applications. These compounds are derivatives of the furanones classed as fimbrolides and include furan-2-ones (formulae IV and V) and pyrrol-2-ones (formulae II, III and IV).

The following citations were identified in the International Search Report:

- D1 WO 2002 000639 (Unisearch Limited) 3 January 2002
- D2 WO 1996 001294 (Unisearch Limited) 18 January
- D3 US 3755356 (Siddall) 28 August 1973
- D4 Chemical Abstract 131:328105
- D5 Chemical Abstract 130:89588
- D6 Chemical Abstract 99:158169
- D7 Chemical Abstract 95:61900
- D8 Chemical Abstract 86:139372
- D9 Chemical Abstract 77:19132
- D10 Chemical Abstract 76:25015
- D11 Chemical Abstract 66:75860
- D12 Chemical Abstract 63:54028
- D13 Chemical Abstract 54:56384

Continued in Supplemental Box

**VIII. Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

- i) Claim 1 is not clear as there is duplication of the terms substituted or unsubstituted (lines 9-11, 15, 16 and 19-21) and the substituent R is not defined.
- ii) The term "associated" in Claim 14 is vague and not supported by the description.
- iii) There are two claims numbered Claim 25 - on pages 56 and 57.
- iv) Claim 26 lacks clarity in regard to its dependence upon Claim 24.
- v) Claim 32 lacks clarity in regard to its dependence upon Claim 32.
- vi) Claim 35 is dependent on Claim 30 but follows immediately after independent Claim 34.

**Supplemental Box**

(To be used when the space in any of the preceding boxes is not sufficient)

**Continuation of V****Novelty**

D1 discloses compound 4n (page 13), generic formula IV, and uses thereof (page 20 lines 17-23) which anticipate Claims 34, 35, 41-57, 71-92 and 99-113.

D2 discloses compound 6 (figure 3) and uses thereof (page 2 line 27-page 3 line 3) which anticipates Claims 34, 35, 41-57, 71-92 and 99-113.

D3 discloses the compounds with the registry numbers (RN) 51301-02-1, 51301-22-5, 51301-24-7, 51301-25-8 (examples 6 and 8) which anticipate Claim 18.

D4 discloses a compound with the RN 87253-32-5 which anticipates Claim 18.

D5 discloses the compounds with the RNs 36600-49-4, 36600-52-9, 36600-55-2, 36600-58-5, 36600-50-7, 36600-53-0, 36600-59-6, 36600-51-8, 36600-54-1, 36637-28-2 which anticipate the Claims 18, 24, 28 and 29.

D6 discloses a compound with the RN 77979-76-8 which anticipates Claims 28 and 29.

D7 discloses the compounds with the RNs 218774-41-5 and 218774-48-2 which anticipate Claims 28 and 29.

D8 discloses a compound with the RN 248249-05-0 which anticipates Claims 28 and 29.

D9 discloses a compound with the RN 4064-10-2 which anticipates Claims 28 and 29.

D10 discloses the compounds with the RNs 14313-01-2, 14398-89-1, 14398-90-4, 14398-91-5 which anticipate Claims 28 and 29.

D11 discloses the compounds with the RNs 108397-78-0, 4064-10-2 which anticipate Claims 28 and 29.

D12 discloses a compound with the RN 4064-10-2 which anticipates Claims 28 and 29.

Claims 18, 24, 28, 29, 34, 35, 41-57, 71-92 and 99-113 are not novel in the light of these citations.

Claims 1-17, 19-23, 25-27, 30-33, 36-40, 57-70, 93-98 and 114-117 are novel in the light of these citations.

**Inventive Step**

D1 and D2 are the most relevant art to the subject matter of the present application.

D1 discloses various fimbrolide derivatives similar in structure to formulae IV and V of the present application. Particularly, D1 discloses a variety of substitution patterns at position 5 of the furanone ring, including, saturated and unsaturated substituted alkyl radicals. It is considered that the skilled organic chemist would identify that the various substitution patterns disclosed in D1 would be interchangeable and would therefore synthesize the compounds disclosed of formula IV of the present application. Consequently, it is considered that Claims 31-38 are not inventive in the light of D1.

D2 discloses fimbrolide derivatives of similar structure to formula IV of the present application. There is no suggestion or disclosure in this document regarding modifications to the ring structure or to the saturation of the substituent in the 5 position of the furanone ring. Consequently, Claims 1-33, 36-43, 58-70, 93-98 and 114-117 are considered inventive in the light of this document.

**Industrial Applicability**

The subject matter defined in the claims is considered to be industrially applicable.